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NAAC GRADE A++

Unit-1

Introduction to S/w Engineering

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- Evolution of S/w Engineering
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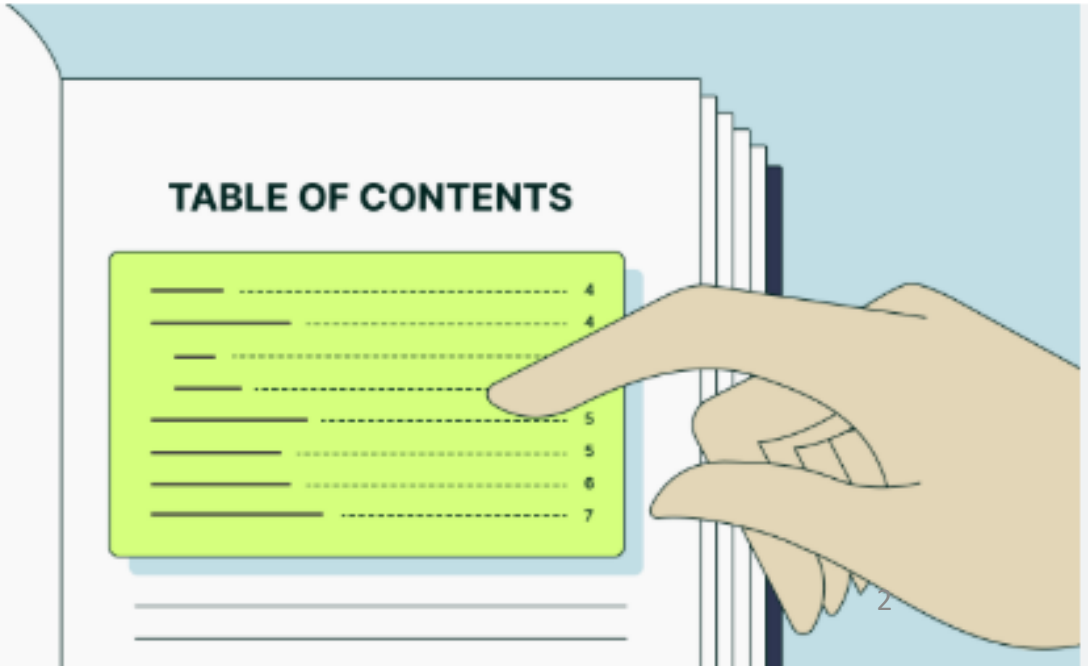
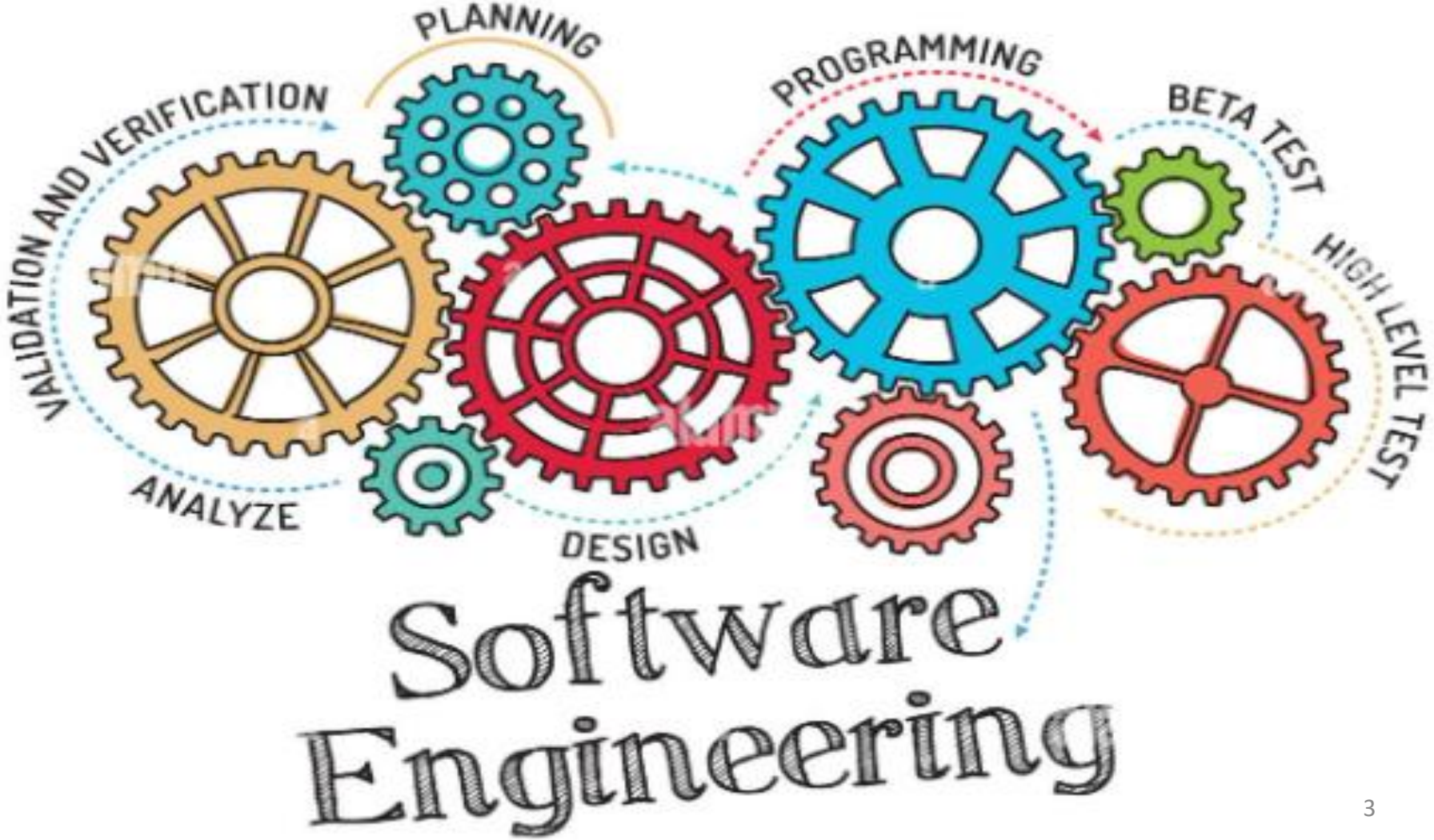



PLANNING
PROGRAMMING
BETA TEST
HIGH LEVEL TEST
DESIGN
ANALYZE
VALIDATION AND VERIFICATION
Software
Engineering

EXAMPLE

- **Non-Branded:**

  Approach Build and Deliver

- **Branded:**

  Follows the Engineering Approach(initial step to last step)

Idea → Maintenance →Regular Updation

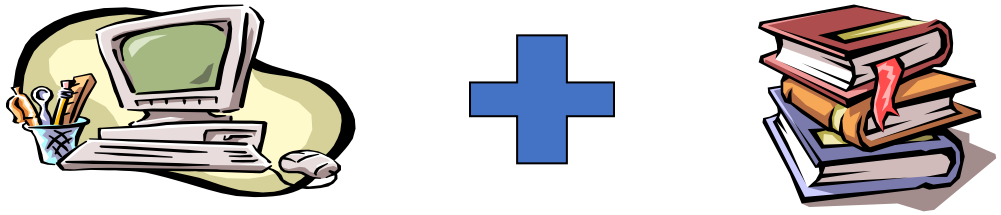
Why is Software Engineering required?

Software Engineering is required due to the following reasons:

- To manage Large software
- For more Scalability
- Cost Management
- To manage the dynamic nature of software
- For better quality Management

What is software?

- **Computer programs** and **associated documentation**



- **Software products** may be developed for a particular customer or may be developed for a general market.
- **Software products** may be

1. **Generic** - developed to be sold to a range of different customers

2. **Bespoke** - developed for a single customer according to their specification

Software Engineering

The **software** is a collection of integrated programs along with proper documentation and user manuals

Engineering is the application of **scientific** and **practical** knowledge to **invent, design, build, maintain**, and **improve frameworks, processes, etc**.

Definition

- Software engineering is the branch of computer science that deals with the design, development, testing, and maintenance of software applications.

- ***Stephen Schach defined*** the same as "A discipline whose aim is the production of quality software, software that is delivered on time, within budget, and that satisfies its requirements".

Evolution and Impact of software Engineering

❑ The term software engineering **originated between 1945-1965**.

- Origin will only happen when **software development** will start.
- In the starting there were many famous **NATO conferences** where actually software engineering was named.

❑ **Crisis**: 1965-1985 **(e.g. OS/360** multi millionaire failure project, **Torus Project)**

- **Why Failure?** Because they had not prepared any design earlier.
- Budget over run.

❑ 1990-2000: The time of **Internet** came.

- And during this time the most famous s/w is **system software(Microsoft Windows)**

❑ 2000-2010: **Light Weight platform**

- Software can run properly on mobile

❑ 2010-Current Time: Time is of **AI,ML,DL**

- We are using the concept of self learning in software

Earlier Proprietary S/w → Free S/w

What is Software Evolution?

Definition:

- Refers to software development process
- Includes timely software updates

Reasons for *Updates*:

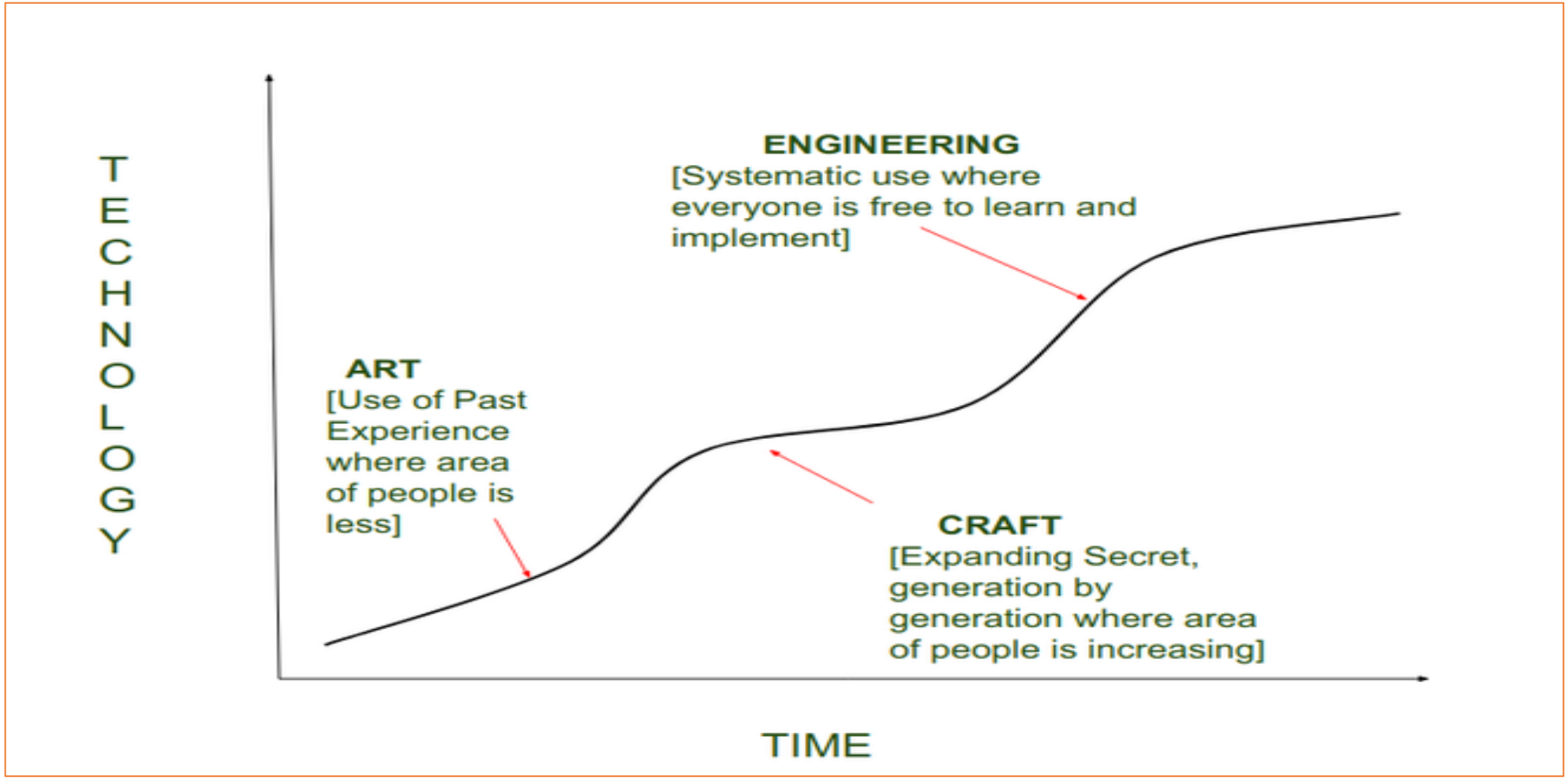
- Adding **new features**
- Removing **obsolete functionalities**

Process:

- Uses software engineering principles
- Adheres to proven **software methods**

Evolution of Software Engineering

Step-by-Step Process of Software Evolution



Contd.

Step-by-Step Process of Software Evolution

- **Software Engineering as an Art**
  Relied on individual creativity and intuition

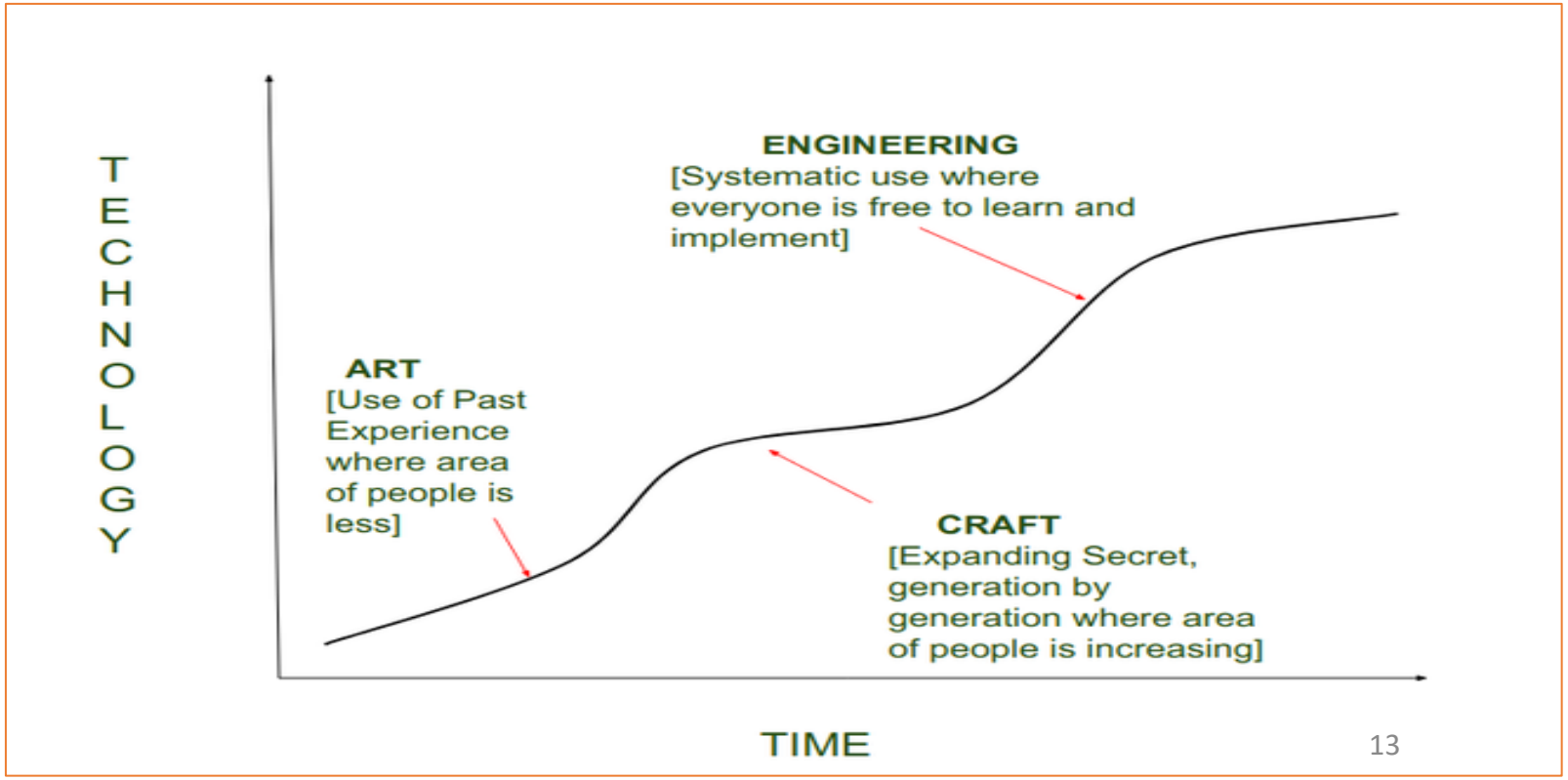
- **Software Engineering Transition from Art to Craft**
  Added repeatable processes and basic guidelines

- **Software Engineering transition from craft to an Engineering Discipline**
  Adopted scientific principles and systematic methods

Contd.

In today's world

- Software engineering is an engineering discipline
- Everyone can learn software design skills
- Coding is accessible without formal degrees



Impact of Software Engineering

Key areas where software engineering has made a significant impact:

- Technological Advancements
- Communication and Connectivity
- Automation and Efficiency

Contd.

- **Technological Advancements**

It has led to the ***development of new technologies***, platforms, and tools that continue ***to shape and transform industries.***

- **Communication and Connectivity**: Revolutionized global interactions and sharing.

(The development of the internet, email, social media, and various communication tools has revolutionized the way people interact, collaborate, and share information across the globe)

- **Automation and Efficiency**: Automation *reduces manual errors*, *enhances productivity*, and allows organizations to operate more smoothly.

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ACTIVITY?

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A CASE STUDY ON “Evolution of Web Browsers”

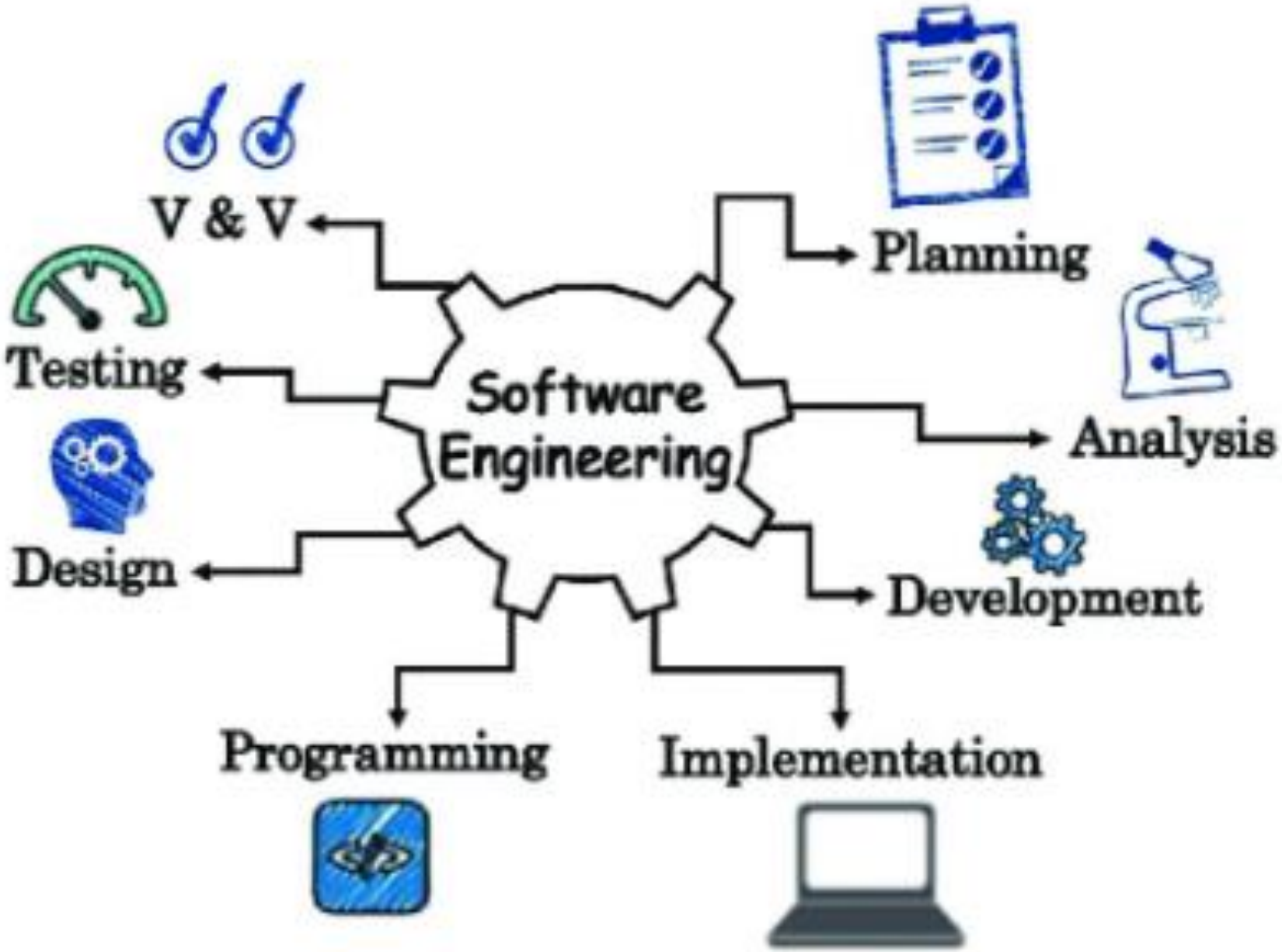
- **Goal**:
  Understand how software engineering drives technological advancements in the modern era.

- **Background**:
  Explore the evolution of web browsers from early text-based interfaces to modern, AI-integrated, feature-rich applications such as **Chrome**, **Edge**, **Safari**, and emerging browsers powered by **cloud computing** and **machine learning technologies**.

Contd.

Objectives of the Case Study

- Trace the Historical Evolution
- Explore Technological Advancements
- Evaluate User Experience Enhancements
- Examine Security and Privacy Considerations
- Discussing Standardization Efforts
- Predict Future Trends


V & V
Planning
Testing
Software Engineering
Analysis
Design
Development
Programming
Implementation

S/w Engg.

- **Bridging Ideas and Reality**

  Transforms abstract concepts into working software solutions